

SELF-OPENING WASTE BIN MANAGER

This application claims priority from U.S. provisional application Ser. No. 60/461,935, filed April 10, 2003, and is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

5 The present invention relates generally to self-opening cabinets, and more particularly to self-opening cabinets in which a waste bin is stored.

Waste bins are often stored in the kitchen behind cabinet doors. In order to access these waste bins, the user must grasp the handle on the door and open the door. Thereafter, the user can deposit trash or recyclable materials into the waste bin. In some situations, the waste bin is stored in a cabinet that has a bin manager mounted therein. The bin manager is a device that holds the waste bin while allowing the waste bin to be extended outwardly from the cabinet after the cabinet door has been opened. By using such a bin manager, a person does not need to reach into the cabinet to deposit articles. Instead, the bin is moved at least partially out of the cabinet, thereby increasing the ease of access to the bin.

15 In the past, bin managers have been designed that allow the cabinet door to be easily opened by way of a foot activated mechanism. Often times a spring or other biasing device is included with the bin manager such that, after actuation of the foot mechanism, the bins in the manager are automatically propelled out of the cabinet a certain distance. The user therefore does not have to pull the bin out of the cabinet because the bin manager is designed to automatically take care of this movement. The design of past bin managers, however, has not been without its disadvantages. In some instances, the bin managers have not been able to be designed that automatically move the bins out of the cabinet when a foot mechanism is operated because of difficulties in positioning a biasing member in a workable location. Further disadvantages of prior bin managers have included the relatively complex nature of their designs, as well as the increased costs that result from such complex designs. A need has therefore existed for bin manager designs that alleviate these disadvantages, as well as other disadvantages.

SUMMARY OF THE INVENTION

Accordingly, the present invention provides a bin manager design that is economical to manufacture, easy to install, and easy to operate. According to one aspect of the present

invention, a waste bin manager for housing at least one waste bin in a cabinet having a door is provided. The waste bin manager includes a first and second elongated slide, a wire harness, a clip, and a spring. The elongated slides are adapted to be mounted within the cabinet in a spaced apart, generally parallel orientation with respect to each other. The wire harness is positioned between the slides and attached thereto. The wire harness is adapted to hold a waste bin. The clip is attached to the wire harness and one end of the spring. An opposite end of the spring is attached to the cabinet. The spring is adapted to pull against the wire harness such that the elongated slides are pulled at least partially out of the cabinet when the door to the cabinet is opened.

According to another aspect of the present invention, a waste bin manager is provided that includes a slide mechanism, a waste bin holder, a clip, and a spring. The slide mechanism is adapted to move between a retracted position within the cabinet and an extended position at least partially outside of the cabinet. The waste bin holder is supported by the slide mechanism and is adapted to hold a waste bin. A clip is releasably attached to the waste bin holder. The spring has one end attached to the clip and another end attached to the cabinet. The spring is adapted to exert a force against the waste bin holder such that the slide mechanism is moved at least partially out of the cabinet when the door to the cabinet is opened.

According to other aspects of the present invention, the wire harness may be adapted to exert a biasing force against the waste bin when held therein. The clip may be adapted to flex in order to be attached or detached from the wire harness. The clip may further be adapted to attach to the wire harness at an intersection of first and second wires in the wire harness. A foot-operated mechanism may be included that allows the door to the cabinet to be opened by kicking or depressing the mechanism with one's foot. The foot-operated mechanism may include a lever, a plate and a magnet, wherein either the plate or the magnet is attached to the cabinet door and the other of the plate and magnet is attached to the cabinet. The spring may be oriented substantially completely in a horizontal plane and may be positioned underneath a waste bin held by the wire harness. The elongated slides may both be attached to the cabinet door and may be the only structures that are attached to the cabinet door.

The benefits of the present invention will be apparent to one skilled in the art upon a review of the following specification and the accompanying drawings.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a partial, perspective view of a bin manager assembly depicted in a retracted position according to one embodiment of the invention;

FIG. 2 is a partial, perspective view of the bin manager of FIG. 1 illustrated in an extended position;

FIG. 3 is a close up, partial, perspective view of a spring clip and spring of the bin manager;

FIG. 4 is an exploded perspective view of a foot-operated door-opening mechanism;

FIG. 5 is a perspective view of the spring clip of FIG. 3;

FIG. 6 is a plan view of the spring clip of FIG. 5;

FIG. 7 is a side, elevational view of the spring clip of FIG. 5;

FIG. 8 is a front, elevational view of the spring clip of FIG. 5; and

FIG. 9 is a sectional view of the spring clip taken along the line IX-IX in FIG. 7.

DETAILED DESCRIPTION OF THE INVENTION

The present invention will now be described with reference to the accompanying drawings wherein the reference numerals appearing in the following written description correspond to like numbered elements in the several drawings. A waste bin manager 20 according to one aspect of the present invention is depicted in FIGS. 1-2. Waste bin manager 20 is attached to a cabinet 22. Cabinet 22 is only partially shown, but may be part of a standard cabinet found in kitchens, or other environments. Cabinet 22 includes a door 24 which conceals most of the components of waste bin manager 20. Door 24 is movable between a closed position (FIG. 1) and an extended position (FIG. 2). In the closed or retracted position, the waste bin or bins that are positioned behind door 24 are concealed from view and cannot be accessed. In order to extend forward waste bin manager 20, a foot-activated mechanism 26 may be utilized. When foot mechanism 26 is so utilized, door 24 is separated from the frame of cabinet 22 and waste bin manager 20 forces door 24 outwardly. Any waste bins or other types of storage receptacles that are being held by waste bin manager 20 are thereafter easily accessible to the user.

Cabinet 22 generally includes two sidewalls 28a and 28b, a bottom wall 30, and a top wall (not shown). These walls define an enclosure 32 which surrounds the main body of waste bin manager 20 when door 24 is closed. As can be seen more clearly in FIG. 2, waste bin manager 20 includes a pair of elongated slides 34a and 34b that are mounted to sidewalls 28a and 28b, respectively. Slides 34a and 34b are movable between a retracted and an extended position. A pair of wire harnesses 36 are secured to slides 34a and 34b. Wire

harnesses 36 are each adapted to hold bins, such as bins for storing trash, recyclable materials, or any other type of waste material. While waste bin manager 20 is illustrated having two wire harnesses 36, it will be understood that the invention finds equal application to waste bin managers that accommodate only a single waste bin.

5 A spring 38 is attached between one of the sidewalls 28 and one of the wire harnesses 36. Spring 38 stretches as waste bin manager 20 is moved to the retracted position. This stretching or extension of spring 38 causes spring 38 to exert a force on the inner most wire harness 36 that urges it towards the extended position. Upon actuation of foot mechanism 26, this force causes wire harnesses 36, slides 34a and 34b, and door 24 to automatically move to
10 the extended position. In this extended position, the user has easy access to the bin or bins that are housed within wire harnesses 36. After access to these bins is no longer desired, the user can simply push on door 24 to cause the door 24, slides 34a and 34b, and wire harnesses 36 to be pushed back inside of enclosure 32 in cabinet 22. Foot mechanism 26 will thereafter retain the bins within cabinet 22 until the foot mechanism is again activated, as will be
15 described more below.

Each slide 34 in the illustrated embodiment is a telescoping slide. Telescoping slides 34 include a stationary member 40 and an extendable member 42 (FIG. 2). Stationary member 40 is attached to the inside of cabinet 22 in any suitable fashion. It may, for example, be secured to one of the sidewalls 28. Extendable member 42 is nested within
20 stationary member 40 and slidable along the length of stationary member 40. The construction of each slide 34a and 34b may be the same as that found in conventional drawer slides used to support drawers in cabinets, desks, and the like. Sets of ball bearings, or other types of bearings, may be sandwiched between stationary member 40 and extendable member 42 to facilitate the sliding of extendable member 42. The front end of each slide 34 is
25 attached to door 24. In the illustrated embodiment, slides 34a and 34b are the only supporting structures that are attached to door 24.

Each wire harness 36 includes a bottom wire 44 and a body wire 46. Bottom wire 44 is positioned near the bottom of wire harness 36 and provides a structure that supports a waste bin and that prevents the waste bin from falling through wire harness 36. Body wire 46
30 is attached to bottom wire 44 and extends vertically upward around a space in which a waste bin may be positioned. Bottom wire 44 and body wire 46 may be secured together by way of welding, or any other suitable fastening technique. One or both of bottom wires 44 and body wires 46 are secured to each extendable member 42 of each slide 34a and 34b. Thus, when

extendable members 42 extend out of cabinet 22 or retract back into cabinet 22, wire harnesses 36 likewise extend out of or retract back into cabinet 22. Each body wire 46 includes a pair of side wires 48 on each of its sides. Side wires 48 preferably abut against the sides of a waste bin positioned in wire harness 36. In the illustrated embodiment, wire harnesses 36 are shaped to hold rectangularly shaped waste bins. It will be understood that the wire harnesses 36 could alternatively be shaped to hold cylindrical shaped waste bins, or other waste bin shapes.

Each body wire 46 further includes a pair of top wires 50. Wire harnesses 36 are preferably constructed so that top wires 50 exert a biasing force in the direction of arrows A (FIG. 2). This biasing force tends to urge top wires 50 of each wire harness 36 towards each other such that a waste bin positioned therebetween is squeezed by the two top wires 50. The waste bin is thereby held snugly within wire harness 36. It will be noted that the wire harnesses 36 in FIG. 2 are depicted in the position they would be in if a waste bin were positioned in each of the harnesses 36. Once the waste bin were removed, each top wire 50 would tend to move toward its opposite top wire 50 in the directions indicated by arrows A. This movement would continue until the flexible wires of the wire harness reached an unflexed condition.

The detailed construction of the foot-activated mechanism 26 can be seen more clearly in FIG. 4. Foot activated mechanism 26 generally includes a plate 52, a lever 54, and one or more magnets 56. Plate 52 includes a plurality of fastener holes 58 which may receive fasteners used to secure plate 52 to the backside of door 24. Plate 52 is preferably made out of a magnetic material which is attracted by magnets. Thus, when plate 52 is positioned against magnets 56 in lever 54, the magnetic force of magnets 56 will hold plate 52 against magnets 56. Lever 54 is pivotably supported by a pair of brackets 60. Brackets 60 support lever 54 such that it may pivot about a pivot axis 62. Each bracket 60 includes an upper fastener aperture 64. Fastener aperture 64 may receive screws, bolts, nails, or any other suitable fasteners that can be used to secure brackets 60 to an underside 66 at base 22a of cabinet 22 (FIGS. 1-2).

Lever 54 includes a front kick surface 68 and a generally flat, bottom surface 70. Lever 54 is shaped and constructed so that gravity will normally cause it to be in the position illustrated in FIG. 4. Specifically, lever 54 will normally be in a position in which the magnets 56 positioned on its front surface will be in a vertical plane. Thus, when plate 52 is positioned in contact with lever 54, plate 52 will be in contact with all of the magnets 56 due

to plate 52 also being oriented in a vertical plane. When it comes time to open door 24 and gain access to the waste bins held by waste bin manager 20, a user can either kick front kick surface 68 or position their foot underneath bottom surface 70 and lift up. Either of these actions will cause lever 54 to rotate about pivot axis 62. This rotation will cause the magnets 56 to no longer be oriented in a vertical plane. Furthermore, lever 56 will push slightly against plate 52 as it is pivoted about pivot axis 62. The combination of this pushing force, along with the decreased magnetic force due to the movement of the magnets out of a vertical plane, will allow plate 52 to magnetically detach from magnets 56. Door 24 can thereafter be opened. Further, once a person has removed their foot from lever 54, it will naturally rotate back to the position in FIG. 4 in which the magnets 56 are aligned in a vertical plane. Once door 24 is closed, the attached plate 52 will come into contact with magnets 56 and once again magnetically lock with magnets 56.

Once plate 52 has become magnetically detached from magnets 56, slides 34a and 34b are free to extend to their extended position. Spring 38 exerts a force that causes the slides 34a and 34b to automatically extend to this extended position. Spring 38 has one end attached to cabinet 22 and the other end attached to a clip 72 secured to the rearmost wire harness 36. FIG. 3 illustrates the attachment of clip 72 to wire harness 36. FIGS. 5-9 illustrate clip 72 in more detail. As can be seen in FIG. 2, spring 38 is preferably attached to the rearmost wire harness along a side opposite the cabinet sidewall to which the other end of the spring is attached. Spring 38 therefore generally extends from one side of waste bin manager to the other. As can also be seen in FIG. 2, spring 38 is generally positioned in a horizontal plane underneath bottom wire 44 of wire harness 36. Spring 38 will therefore be positioned underneath a waste bin that is held by harness 36.

The details of spring clip 72 are illustrated in more detail in FIGS. 5-9. Spring clip 72 includes a body 74, a pair of channel arms 76, a pair of hook arms 78, two sets of upper projections 80, and two lower projections 82. Channel arms 76 define a channel 84 that extends longitudinally along a portion of body 74. Channel 84 is generally shaped as a cylindrical channel. Channel 84 is adapted to receive one of the wires from wire harness 36. Specifically, channel 84 is adapted to receive body wire 46 of wire harness 36. As illustrated more clearly in FIG. 8, channel arms 76 include lower shoulders 86. Shoulders 86 are generally flexible and adapted to flex away from each other as body wire 46 is inserted therein. After body wire 46 is completely nested within channel 84, shoulders 86 will snap or flex back to their original, unflexed position. Clip 72 thus snaps onto body wire 46.

Hook arms 78 curve generally upward and include an upper surface 88. Upper surfaces 88 are horizontally aligned with each other and adapted to contact the underside of bottom wire 44 in wire harness 36. This can be more easily seen in FIG. 3 where hook arms 78 are illustrated extending around the bottom of bottom wire 44. With hook arm 78 wrapped partially around bottom wire 44, such as illustrated in FIG. 3, clip 72 is firmly secured to wire harness 36. The snap-fitting attachment of body wire 46 in channel 84 prevents clip 72 from moving in a lateral or side-to-side direction. The hooking by hook arms 78 of bottom wire 44 prevents clip 72 from moving longitudinally in the direction in which the slides 34a and 34b extend and retract. Still further, the snap-fitting grip of channel arm 76 and shoulders 86 around body wire 46 substantially prevents clip 72 from moving vertically in the up or down direction. Clip 72 is thus firmly secured in a fixed position on wire harness 36. In order to remove clip 72, a person can push upward on clip 72 adjacent the very ends of channel arm 76. If sufficient force is applied, shoulders 86 will flex apart from each other and allow body wire 46 to exit out of channel 84. The outward movement that causes channel arm 76 to release body wire 46 also causes hook arm 78 to unhook from bottom wire 44. Clip 72 can therefore be easily disengaged from wire harness 36, if desired.

Clip 72 further includes two spring attachment regions 90. One attachment region 90 is positioned on one side of clip 72 and the other attachment region 90 is positioned on the other side of clip 72. Spring attachment regions 90 provide structures to which spring 38 can be attached. Specifically, spring 38 is attached to clip 72 by seating the end of the spring loop in one of the spring channels 92 defined between upper projections 80 and lower projection 82 (FIG. 8). When the end of the spring 38 is positioned therein, the spring is generally prevented from detaching from clip 72 by way of the bottom surfaces of upper projections 80, the upper surface of lower projection 82, and a side surface 94 on lower projection 82. In order to insert the end loop of the spring into spring channel 92, it can first be positioned on an angled surface 96 defined on the top of lower projection 82. Once the spring is so positioned, it can be pushed toward the body 74 of clip 72. Because of the angled nature of surface 96, this movement will cause the spring to move upwardly as it is pushed towards body 74. This upward movement will eventually cause the spring to contact the lower side of upper projections 80. After this contact is made, further movement of the spring toward body 74 is accomplished by a slight flexing of the spring as well as a slight flexing of upper projections 80. After the spring has been pushed completely past angled surface 96, it has completely entered spring channel 92. Reversing the movement of the

spring out of spring channel 92 is difficult because angled surface 96 is not angled in a manner that is conducive to exiting the spring out of channel 92. Specifically, side surface 94 presents a straight, vertical surface that must be overcome in order to exit the spring out of channel 92. In other words, the end loop of spring 38 is inserted into spring channel 92 by
5 orienting the end loop of spring 38 in one direction—that is so that the end loop is generally orthogonal to lower projection 82. In this orientation, the cross-section of the end loop allows the end loop to pass between surface 96 and upper projections 80. Thereafter, the end loop of the spring is rotated to another orientation—for example, rotated approximately 90°—so that the end loop is seated in channel 92 but then captured therein by lower
10 projection 82 and upper projections 80. Spring channel 92 therefore provides a secure structure for holding one end of the spring 38.

It will be understood that the dimensional references depicted in FIGS. 6-9 are in inches. For those dimensions that are depicted with an asterisk, the dimensions are centered to the clip 72. It will be understood, however, that the dimensions of clip 72 depicted in the
15 drawings can be varied substantially without departing from the scope of the invention. While other materials may be used to construct clip 72, it is preferably made of plastic, such as nylon, or another suitable plastic.

While the present invention has been described in terms of the embodiments discussed above and depicted in the drawings, it will be understood by one skilled in the art
20 that the present invention is not limited to these particular embodiments, but includes any and all such modifications that are within the spirit and scope of the present invention as defined in the appended claims.